Heart failure is a descriptive clinical syndrome, which encompasses the consequences of both right and left ventricular dysfunction (systolic and non-systolic). Systolic left ventricular dysfunction, about which there is most epidemiological and experimental evidence, is a malignant disease. In a recent population based study more than one third of patients had died within 12 months of diagnosis.

Estimates of the prevalence of systolic left ventricular dysfunction range from 3–20 per 1000 in the general population. Over the age of 65 this value rises to 30–130 per 1000.

The true prevalence of the syndrome of heart failure is probably significantly higher, because of asymptomatic systolic (or non-systolic) left ventricular dysfunction. Taking a crude prevalence of systolic left ventricular dysfunction of 2% suggests that one million people are affected in the UK. Two thirds will die within five years. Despite this, to date heart failure has received less attention than its cancerous counterparts (Table 1).

This contrast is highlighted by the recent recommendation of a two week maximum on the time patients with suspected heart failure is a malignant disease. In a recent population based study more than one million people are affected in the UK. Two thirds will die within five years. Despite this, to date heart failure has received less attention than its cancerous counterparts (table 1).

The number of heart failure cases is likely to rise. This is because of the successful management of ischaemic heart disease, which serves to defer a cohort of cardiac morbidity, the better management of patients who already have heart failure, and the increasing numbers of elderly patients in the population. Elderly patients with heart failure are often taking several medications and have little understanding of their condition. They are frequently readmitted, often because of poor symptom control and reduced compliance.

### TREATMENT OF HEART FAILURE

Several highly effective treatments exist for heart failure and authoritative guidelines have been produced. Despite the evidence base, the management of heart failure remains fragmented. This in part may relate to a lack of communication and understanding between secondary and primary care. The IMPROVEMENT study has examined both the perception and understanding of the symptoms and signs of heart failure and the rationale behind diagnostic tests. Interpretation of diagnostic findings is less well understood and initiation of treatment remains (particularly in the UK) predominantly within secondary care. A dichotomy exists with initial recognition and long term care of heart failure lying within primary care, but with diagnosis and prescribing in secondary care.

### THE NATIONAL SERVICE FRAMEWORK

The National Service Framework for coronary heart disease (NSF) specifically addresses heart failure and has started to identify processes to improve the delivery of care for patients with heart failure. The objective of the document is “to help people with heart failure live longer and achieve a better quality of life”. Standard 11 of the NSF states “doctors should arrange for people with suspected heart failure to be offered appropriate investigations that will confirm or refute the diagnosis. For those in whom heart failure is confirmed, its cause should be identified and the treatments most likely to both relieve symptoms and reduce the risk of death should be offered”. Milestones are set by which time components of the service are expected to be in place.

Achievement of the standard will require a more structured systematic approach to the diagnosis and management of patients with heart failure than has hitherto been available. In order to improve links between primary and secondary care three possible service delivery models are proposed:

- outreach follow up of heart failure patients following discharge from hospital
- multidisciplinary support in the community for those with established heart failure
- heart failure clinics for investigation and/or follow up

In establishing heart failure clinics the recommendations propose that such clinics could be located in primary or secondary care. The clinics should ideally be set up as pilot projects with evaluation built in and could be led by nurse practitioners or doctors.

The medical literature contains several reports of nurse based intervention. In Sweden, where nurse led heart failure care was first established in 1990, Cline and colleagues identified a trend towards reduced readmission. A study of broader multidisciplinary input during and after index admission in the USA found a 13% reduction in the absolute numbers of admission, with a halving of the number of admissions for heart failure. A study of 200 patients in Australia found that, when compared to usual care, a single home visit 7–14 days after discharge reduced the rate of “unplanned admission” (68 v 118, p = 0.03); within the intervention group duration of readmission was reduced.

Within the UK, in a recent randomised controlled trial of 165 patients admitted with heart failure, specialist nurse intervention before and up to one year after discharge reduced all readmissions (86 v 114, p = 0.018) and length of hospital stay for heart failure (3.43 v 7.46 days, p = 0.005).

Studies reported to date have concentrated upon the impact of nurse based intervention, during and after index admission, on readmission and length of stay. All studies have been developed as research projects within specialist units.

We report the development and progress to date of a district general hospital based, nurse led, heart failure clinic. The

| Table 1 The incidence and prognosis of heart failure and common cancers in the Scotland |
|-----------------------------------------------|-----------------|-----------------|
| Annual incidence | Estimated mortality (%) | 3 year | 5 year |
|-----------------------------------------------|-----------------|-----------------|
| **Men** | | | |
| Heart failure | 1.3/1000 | 60 | 75 |
| Lung cancer | 0.8/1000 | >90 | 95 |
| Bowel cancer | 0.6/1000 | 55 | 65 |
| Prostate cancer | 0.5/1000 | 45 | 55 |
| **Women** | | | |
| Heart failure | 1.3/1000 | 65 | 75 |
| Breast cancer | 0.8/1000 | 25 | 35 |
| Bowel cancer | 0.4/1000 | 55 | 65 |
| Lung cancer | 0.4/1000 | >90 | 95 |
clinic was established to meet NSF requirements to provide comprehensive diagnosis and treatment both to patients recently discharged from hospital and those within the community.

THE HASTINGS HEART FUNCTION CLINIC

Hastings

Hastings and Rother National Health Service Trust is situated on the south coast of England. The Conquest Hospital serves an elderly population of approximately 185,000 comprising a deprived urban area and large rural and semi-rural retirement population (one of the largest in Europe).

An audit of acute medical admissions in 1995 identified 169 admissions with heart failure in a four month period (8% of total admissions). In the majority of patients care was suboptimal, in particular with regard to the diagnosis of underlying aetiology, adequacy of angiotensin converting enzyme (ACE) inhibitor dosage, monitoring of electrolytes, and concurrent medication.

As a consequence, a part time ward based heart failure nurse was recruited in 1998. This post concentrated on the pre-discharge phase of care, and provided patients with information regarding their condition and maintenance of fluid balance, as well as gathering data for further audit on discharge prescribing. The single most important remit of the post was to develop a culture of specialist heart failure care with internal referral.

The hospital already had an active cardiac department with a culture of access to all investigations, including echocardiography and angiography, dictated by need and not age. Furthermore, the department has a history of nurse led cardiology services, including hyperlipidaemia clinics, and an extensive rehabilitation support programme following cardiac admissions.

A physician with an interest in heart failure was appointed to the department of medicine for the elderly in 1995. This physician contributes to general clinics within the cardiology department with a specialist remit of cardiovascular medicine.

A business plan for the development of local heart failure services was presented to the health authority in 1998. The proposal identified a role for two nurses, one based within the hospital and one based within the community. This proposal did not initially receive financial support (as was anticipated).

The proposal did, however, create a channel for further discussion regarding future development of the service and enabled the heart failure proposal to be incorporated into the trust’s service development plans. Full funding for one post has now become available.

A further audit was recently performed. Data on all medical admissions to the Conquest Hospital were collected prospectively for one year period. Of 10,030 admissions there were 1,251 coded cases of heart failure (12.5% of total). After validation against the European Society of Cardiology (ESC) guidelines for the diagnosis of heart failure, 434 patients were identified with systolic left ventricular dysfunction (4.3% of total). The average age was 79 years, and 71% of patients were over the age of 75.

The Omada project

The Omada project is a secondary care, nurse led, patient management programme supported by Roche Pharmaceuticals. The programme was developed in 1999, by a steering committee of physicians with an interest in heart failure from nine hospitals in England, Scotland, and Wales, to improve the education and treatment of patients with heart failure. The programme was established by the appointment of a trained nurse specialist in each hospital. The majority were attached to specialist clinics in tertiary centres, two were attached to district general hospitals (Hastings and Portsmouth). The nurses were employed by a third party (Ventiv Health) which organised an initial two week education course that included medical training in heart failure pathology and management, the audit process, development of IT, and the organisational skills necessary to set up a nurse led outpatient clinic. Following placement support was provided for ongoing project management and professional development.

Establishment of a nurse led clinic

Phase I: commitment and culture—the process to date

As part of the Omada project we have developed a nurse led heart failure clinic at the Conquest Hospital, Hastings.

Access to the clinic is via outpatient referral or from ward referral before discharge. The supervising consultant and nurse review all new patients, and a management plan is agreed with the patient. At the first clinic appointment, patient details are entered onto an electronic patient management system. An assessment is made of the patient’s educational needs, severity of symptoms, risk factors, and drug treatment, providing an opportunity to optimise management and to devise an individual care plan. Assessment is based upon a protocol derived from the guidelines of the European Society of Cardiology and the Scottish Intercollegiate Guidelines Network.

Patients suitable for β-blockade are identified and initiation and up-titration is supervised in a weekly nurse led clinic. The nurse assesses each patient’s physical status including blood pressure, pulse, and respiratory examination. An ECG is obtained at each review. The patients are then monitored for 2–3 hours as per protocol and given literature regarding their condition and a telephone contact should they require further support. All patients are then reviewed at 1–2 weekly intervals.

On average the up-titration clinic will review 6–8 patients per clinic with two spaces for emergency review. Once patients have been optimised they are then referred back to the formal heart function clinic for review by the medical team. Patients are followed up closely until stable and on optimal medication.

Where aetiology of heart failure is not established further investigations are undertaken. Coronary angiography is considered in all patients under the age of 75 with systolic left ventricular dysfunction. The nurse is supervised and supported by the consultant physician. The nurse may initiate a protocol based change in medication; prescribing is by the supervising physician.

Heart failure is not a simple disease to diagnose or to manage. Establishment of the clinic required the formation of a local care network (fig 1). The local department of cardiology provided direct access from the clinic for echocardiography and ECG studies. Direct listing for cardiac catherisation is available to the supervising consultant.

Complex arrhythmia management, automatic implantable cardioverter-defibrillator implantation, and biventricular pacing have been made available through a local clinic provided by a visiting consultant electrophysiologist.

Links with a tertiary centre specialising in heart failure are available for advanced diagnosis and prognostic stratification, through cardiac magnetic resonance imaging and cardipulmonary exercise testing, and assessment for transplantation.

For the first four months ward based referrals were assessed by the nurse and seen in a general clinic as “add-on” patients. As new patient and consultant based referrals increased an alternate week heart function clinic was established in July 2000 that now sees approximately 25 patients per week.

In the first year 198 patients were reviewed by the nurse. Optimisation of existing diagnosis or treatment was required in more than 80% of new patients seen. The average number of clinic visits to the nurse, which includes β blocker initiation and up-titration, is five visits per patient. Patient demographic and treatment details are given in table 2.

To facilitate clarity and uniformity of communication between the clinic and general practitioners, all clinical

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documentation is through a designated template with specific entry field for results of investigation, duration and dosage of medications, as well as further multidisciplinary care. A free text field documents management changes. The documentation is undergoing formal evaluation.

A full care pathway based upon the ESC guidelines has been produced. The care pathway incorporates a core data set (table 3). This has been developed on the basis of recommendations from the NSF, the American Heart Association document Team management of patients with heart failure, and the requirements of the joint American Heart Association/American College of Cardiology statement on Measuring and improving quality of care.

The initial establishment phase of the clinic is now complete. Referrals remain on a “word of mouth” basis. Demand has now required that the clinic is formally launched and available on a weekly basis.

Critical components of phase I
The core element of the service is a trained, skilled nurse capable of taking a lead, with appropriate clinical supervision (table 4). Care delivered through computer based protocols enables nurse led optimisation and initiation of treatment. Professional supervision was available throughout from a nurse project leader provided by Ventiv Health. Frequent support meetings enabled self development and the exchange of ideas between the specialist nurses, all of whom were setting up clinics in differing environments.

Development of a nurse led service was facilitated by a pre-existing awareness of local need, local clinical expertise, and a local culture of internal referral and needs based assessment. A culture of nurse led heart failure care had been established by the prior development of a part time heart failure nurse. The need for time, effort, and communication are self evident at all levels of the development. This includes, for example, the availability of the supervising consultant to answer questions raised by a patient over the telephone, time taken by the nurse to explain the service to other medical teams, to gather data and arrange the clinic, or to talk to relatives on the ward. These key cultural components are easy to underestimate.

It is important that service growth parallels demand. Engendering excessive early demand risks premature failure to deliver. Initial attention was therefore focused on ensuring adequate service provision. A process of “organic” service growth in pace with the increasing local and community awareness of the service was allowed to occur. “Visibility” within the hospital and hence demand for internal referral was secured initially by the appointment of a part time nurse and, for example, by the turnover of junior doctors who assist in the clinic and move on to other firms. Now that internal demand can be met broader visibility within the local community is being pursued (fig 2).

The care pathway has acted as a flag for the wider dissemination of the service.

Establishment of a nurse led clinic
Phase II: integration of the clinic across secondary and primary care—the next step
Following review by local primary care cardiology leads and tertiary heart failure centres the pathway will be ratified and incorporated into the local intranet. Local guidelines for referral to the clinic are being developed, and once these are finalised the clinic will be formally “launched” and awareness of the service will be raised.

Audit data will be available to meet the NSF target of April 2002. The data available will act as benchmarking for local heart failure care.
Personal development of all individuals involved in the project is essential. Further training in clinical skills will be developed for the specialist nurse towards the award of nurse consultant status.

The care pathway was constructed with the help of junior medical staff who will be involved in the audit as part of college requirements.

Exercise training in heart failure is the subject of an MSc dissertation by a staff grade attached to the clinic. This will inform the development of an exercise based rehabilitation programme.

Local weekly team meetings are being set up.

The service will not run properly until there is full community involvement. Links with local general practice and practice nurses with an interest in heart failure are underway. Local primary care trusts have requested the establishment of a new local one stop service. Structured devolution of heart failure care is proposed once local specialist skills have been developed.

Educational sessions for patients and their carers are under development. These will include a dietician, a pharmacist, a nurse, and medical input. A link with the Macmillan services is proposed for terminal care. Audit will include patient views of the service and suggestions for development. Critical components of phase II are shown in table 5.

Establishment of a nurse led clinic

Phase III: the future

As part of the Omada project the nurse specialists are involved in “rolling out” the clinic structure to local hospitals that are developing heart failure services with nurse support. A wider
network of heart failure care may be possible allowing service accreditation and regional benchmarking of service quality.

CONCLUSION
Heart failure is a physically and socially limiting disease that carries a burden of morbidity and mortality worse than many cancers. A structured, integrated approach to the identification, diagnosis, and management of heart failure is mandatory if this burden is to be reduced. Treatment is complex and requires multidisciplinary care across pre-existing boundaries. The development of a comprehensive nurse-led local heart function clinic has improved access to investigation and allowed optimisation of care of patients with heart failure. Development of a care pathway will allow audit of the service and the establishment of a culture of: first things first, “organic growth”, visibility, and care pathways. Most urgent perhaps is the need for heart failure to receive the attention afforded to its cancerous, though often less malignant, counterparts.

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Table 4 Critical components of phase I

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<tr>
<td>• trained nurse specialist</td>
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<td>• specialist support/tertiary links</td>
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<td>• time and effort</td>
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<td>• communication</td>
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The consolidation and integration of the network through:

- incorporation of the care pathway
- personal development
- patient involvement
- structured devolution

Table 5 Critical components of phase II

The establishment of a culture of:

- first things first
- “organic growth”
- visibility
- care pathways

Comparison of, for example, the local rate of ACE inhibitor use against grouped peer data. Activity outwith the pooled peer average might indicate the need for review.

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